41st SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

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SETI IN BERKELEY: WHAT NOW? WHERE NEXT?

Abstract

I'll present the current status of the Berkeley SETI efforts and how they've expanded in both the bandwidth and the time-scales over which we can detect signal.

The SEVENDIP optical pulse search looks for ns time scale pulses at visible wavelengths. It utilizes an automated 30 inch telescope, three ultra fast photo multiplier tubes and a coincidence detector.

The SERENDIP V.v sky survey searches for radio signals at the 300 meter Arecibo Observatory. The currently installed conguration supports 128 million channels over a 200MHz bandwidth with 1.6 Hz spectral resolution. Frequency stepping allows the spectrometer to cover the full 300MHz band of the Arecibo L-band receivers.

SETI@home uses the desktop computers of volunteers to analyze over 240 TB of data at taken at Arecibo. Over 6 million volunteers have run SETI@home during its 10 year history. The SETI@home sky survey is 10 times more sensitive than SERENDIP V.v but it covers only a 2.5 MHz band, centered on 1420 MHz. SETI@home searches a much wider parameter space, including 14 octaves of signal bandwidth and 15 octaves of pulse period with Doppler drift corrections from -100 Hz/s to +100 Hz/s.

The Astropulse project is the rst SETI search for μs time scale pulses in the radio spectrum. Because pulses are dispersed by the interstellar medium, and the amount of dispersion is unknown, Astropulse must search through 30,000 possible dispersions. Substantial computing power is required to conduct this search, so the project uses volunteers and their personal computers to carry out the computation (using distributed computing similar to SETI@home). 114 potential sources of dispersed pulses were detected in the first round of data analysis. Two of these corresponded to known pulsars, the rest do not. We have re-observed 70 of these sources and are in the process of analyzing the resulting data.

Berkeley SETI has also expanded to other telescopes. We have used the Green Bank Telescope with

the GUPPI processor to record dual polarization time domain data for an 800 MHz band. We are using a "software SERENDIP" spectrometer for analysis with incoherent dedispersion and incoherent dechirp analysis for the initial analysis phase, and sending the data out through SETI@home for more detailed coherent analysis. Data has been recorded for a survey of the Kepler field and for longer observations of about 100 Kepler objects of interest.